10th Class 2017

Biology	Group-II	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

(Part-I)

2. Write short answers to any FIVE (5) questions: 10

(i) What are lenticels? Describe their function.

Ans In woody stems and mature roots, the entire surface is covered by bark which is impervious to gases or water. However, there are certain pores in the layer of bark. These are called the lenticels. The lenticels allow air to pass through them.

(ii) Differentiate between acute and chronic bronchitis.

Ans Acute and chronic bronchitis are two major types of bronchitis:

1. The acute bronchitis usually lasts about two weeks and patients recover with no permanent damage to the bronchi or bronchioles.
2. In chronic bronchitis, the bronchi develop chronic inflammation. It usually lasts for three months to two years.

(iii) Define osmoregulation.

Ans Osmoregulation is defined as the regulation of the concentration of water and salts in blood and other body fluids. Kidneys play important role in osmoregulation by regulating the water contents of blood. It is an important process as excessive loss of water concentrates the body fluids whereas excess intake of water dilutes them.

(iv) What is meant by guttation?

Ans If there is a high water content in soil, water enters the roots and is accumulated in xylem vessels. Some plants such as grasses force this water through special pores, present at leaf tips or edges, and form drops. The appearance of drops of water on the tips or edges of leaves is called guttation.

(v) Describe any two causes of kidney failure.

Ans The main causes of kidney failure are diabetes mellitus and hypertension. In certain cases, overdoses of drugs and sudden interruption in the blood supply to the kidneys cause kidney failure. The main symptoms of kidney failure are the high level of urea and other wastes in the blood. These cause vomiting, nausea, weight loss, frequent urination and blood in urine. Excess fluids in the body may also cause the swelling of legs, feet and face and shortness of breath. The kidney failure is treated with dialysis and kidney transplant.

(vi) What is blind spot?

Ans The optic nerve enters retina on the point of optic disc. There are no rods and cons at this point, that is why it is referred to as the blind spot.

(vii) Owl is unable to see during daytime. Give reason.

Ans Owl is unable to see during daytime. The reason for this is the deficiency of cones which receive and sense the bright light. But the presence of more rods gives it greater power of vision during night.

(viii) How ears maintain the balance of body?

Ans Semicircular canals and vestibule help to maintain the balance of body. Semicircular canals contain sensory nerves which can detect any movement of head. Vestibule can detect any changes in the posture of body. The neurons coming from these two receptors reach cerebellum through the auditory nerve.

3. Write short answers to any FIVE (5) questions: (10)

(i) Differentiate between compact bone and spongy bone.

Ans The hardest layer of the bone, on the outside, is called compact bone. The interior of bone

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porous. It is called spongy bone. Spongy bone contains blood vessels and bone marrow.

(ii) What is rheumatoid arthritis?

Ans It involves the inflammation of the membranes at joints. Its symptoms include fatigue, low-grade fever, pain and stiffness in joints.

(iii) Define oogenesis.

Ans The formation of ovum (egg cell) is called oogenesis.

(iv) Give two disadvantages of vegetative propagation.

Ans The two disadvantages of vegetative propagation of plants are as follows:

1. The plants do not have genetic variations.
2. Certain specific diseases attack on the plants. Thus sometimes, the entire crop is destroyed.

(v) Differentiate between epigeal germination and hypogeal germination.

Ans In epigeal germination, the hypocotyl elongates and forms a hook, pulling the cotyledons above ground. Beans, cotton and papaya are the examples of seeds that germinate this way. While in hypogeal germination, the epicotyl elongates and forms the hook. In this germination, the cotyledons stay underground. Pea, maize and coconut germinate this way.

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(vi) State the law of segregation.

Ans In each organism, the genes are present in pairs. During gamete formation, the genes of each pair segregate from each other and each gamete receives one gene from the pair. When the gametes of male and female parents unite, the resulting offspring again gets the genes in pairs. These conclusions were called the law of segregation.

(vii) What is inheritance?

Ans "Inheritance means the transmissions of characteristics from parents to offspring."

(viii) **What are nucleosomes?**

Ans The structures formed by the wrapping of DNA around histone proteins is called nucleosomes.

4. Write short answers to any FIVE (5) questions: (10)

(i) **Define food chain and food web.**

Ans **Food chain:**

A food chain is a series of organisms within an ecosystem, in which each organism feeds on the one before it and is fed by the one after it.

Food web:

A network of food chains which are interconnected at various trophic levels is called as food web.

(ii) **What is meant by nitrogen fixation?**

Ans The conversion of nitrogen gas into nitrates is called as nitrogen fixation.

(iii) **What is genetic engineering?**

Ans Genetic engineering is the artificial synthesis, modification, removal, addition and repair of the genetic material (DNA).

(iv) **Write any two characteristics of transgenic animals.**

Ans Following are two characteristics of transgenic animals:

1. Transgenic animals like goats, chicken, cows give more food and milk etc.
2. Many animals have been made transgenic to get medicines through their milk, blood or urine.

(v) **How the microorganisms produce single cell protein?**

Ans Single-Cell Protein (SCP) refers to the protein content extracted from pure or mixed cultures of algae, yeasts, fungi or bacteria. For the production of single-cell proteins, the microorganisms are grown in fermenters

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These microorganisms utilize a veriety of substrate like agricultural wastes, industrial wastes, natural gas like methane etc. Microorganisms grow very vigorously and produce a high yield of protein.

(vi) Define pharmacology.

Ans Pharmacology is the study of drug composition, properties and medical applications. The sources of drugs are also studied in pharmacology.

(vii) What are hallucinogens?

Ans Hallucinogens are the drugs that cause changes in perception, thought, emotion and consciousness.

(viii) Write about some drugs obtained from plants.

Ans 'Digitalis' is a cardiotonic. It is made from the leaves of foxglove plant. Similarly, 'Morphine' is obtained from the juice of opium poppy plant. It is used for relieving pain. Moreover, the antibiotic 'Penicillin' comes from a fungus.

(Part-II)

NOTE: Attempt any TWO (2) questions.

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Q.5.(a) Name the organs which work for homeostasis in humans. Describe in detail the work of two organs only. **(4)**

Ans The organs which work for homeostasis in human are:

1. Skin 2. Lungs 3. Kidneys

1. Skin:

We know that our skin consists of two layers. Epidermis is the outer protective layer without blood vessels while dermis is the inner layer containing blood vessels, sensory nerve endings, sweat and oil glands, hairs and fat cells.

Skin performs important role in the regulation of body temperature. The thin layer of fat cells in the dermis insulates the body. Contraction of small muscles attached to hairs forms 'Goosebumps'. It creates an insulating blanket of warm air.

Similarly, skin helps in providing cooling effect when sweat is produced by sweat glands and excess body heat escapes through evaporation. Metabolic wastes such as excess water, salts, urea and uric acid are also removed in sweat.

2. Lungs:

We have learned how lungs maintain the concentration of carbon dioxide in the blood. Our cells produce carbon dioxide when they perform cellular respiration. From cells, carbon dioxide diffuses into tissue fluid and from there into blood. Blood carries carbon dioxide to lungs from where it is removed in air.

(b) Write a note on forebrain. **(4)**

Ans **Forebrain:**

It is the largest part of the brain. The important parts of forebrain are as follows:

(i) Thalamus:

It lies just below the cerebrum. It serves as a relay center between the various parts of the brain and the spinal cord. The thalamus is involved in pain perception and consciousness (sleep and awakening).

(ii) Hypothalamus:

It lies above the midbrain and just below the thalamus. Its size is roughly the size of an almond. Hypothalamus links the nervous system and endocrine system. It also controls the feelings such as pain, sorrow, pleasure, rage, etc.

(ii) Cerebrum:

It is the largest part of the forebrain. It controls the movement of skeletal muscles, thinking, intelligence and emotions.

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Q.6.(a) What is skeletal system? Write the role of skeletal system. (4)

Ans **Skeletal system:**

Skeletal system or skeleton is defined as the framework of hard, articulated structures that provide physical support, attachment for skeletal muscles, and protection for the bodies of animals. Like other vertebrates, the human skeleton is on the inside of body and is called endoskeleton.

Role of Skeletal System:

The big functions of skeletal system are protection, support and movements. In our body, skeleton works very closely with the muscular system to help us move. Similarly, skeleton provides protection to many internal organs *e.g.,* skull protects brain, vertebral column protects spinal cord and ribs protect most of our other internal organs. Vertebral column also provides the main support to our body mass.

(b) Write a note on the development and structure of seed. (4)

Ans **Development and Structure of Seed:**

After fertilization in the female gametophyte, zygote divides repeatedly by mitosis and develops into an embryo. At this stage (in gymnosperms and angiosperms), ovule changes into seed. The formation of seed completes the process of sexual reproduction in seed plants.

Angiosperm seeds consist of three distinct parts: (1) the embryo formed from zygote, (2) the endosperm tissue formed from endosperm nucleus, and (3) the seed coat which develops from the wall of ovule (integument).

Seed coat (or testa) develops from the integument, originally surrounding the ovule. It may be a paper-thin layer (*e.g.,* peanut) or thick and hard (*e.g.,* coconut). Seed coat protects embryo from mechanical injury and from drying out. There is a scar on seed coat, called hilum. It is where the seed is attached to ovary wall (fruit). At one end of hilum, there is micropyle. This is the same opening through which the pollen tube entered ovule. Seed uses it for the absorption of water.

Embryo is actually an immature plant. It consists of a radicle, a plumule and one or two cotyledons (seed leaves). The radicle of embryo develops into new root while the plumule develops into new shoot. The embryonic stem above the point of attachment of cotyledon(s) is called epicotyl. The embryonic stem below the point of attachment is hypocotyl. Within seed, there is a store of nutrients for the seedling that will grow from embryo. In angiosperms, the stored food is derived from the endosperm tissue. This tissue is rich in oil or starch and protein. In many seeds, the food of the endosperm is absorbed and stored by cotyledons.

Q.7.(a) Write a note on carbon cycle. (4)

Ans **Definition:**

Carbon cycle is a perfect cycle in the sense that carbon is returned to atmosphere as soon as it is removed. Carbon atom is the principal building block of many kinds of biomolecules. Carbon is found as graphite and diamond in nature. It also occurs as carbon dioxide in atmosphere.

Sources of carbon:

Major source of carbon for the living world is carbon dioxide present in atmosphere and water. Fossil fuels like peat, coal, natural gas and petroleum also contain carbon. Carbonates of Earth's crust also give rise to carbon dioxide.

(i) Photosynthesis:

The major process that brings carbon from atmosphere or water into living world is photosynthesis. Producers take in carbon dioxide from atmosphere and convert it into organic compounds. In this way, carbon becomes a part of the body of producers. This carbon enters food chains and is passed to herbivores, carnivores and decomposers.

(ii) Respiration:

Carbon dioxide is released back to environment by respiration of producers and consumers.

(iii) Decomposition:

Carbon is also released by respiration of producers and consumers. It is also released by the decomposition of organic wastes and dead bodies by decomposers.

(iv) Wood and fossil fuels:

Burning of wood and fossil fuels also adds large amount of carbon dioxide into atmosphere.

(b) Describe the advantages of using fermenters. (4)

Ans **Advantages of using Fermenters:**

For each biotechnological process, the environment provided to the organisms must be monitored and controlled. Such a controlled environment is provided by fermenters. A fermenter optimizes the growth of the organisms by controlling many factors like nutrients, oxygen, growth inhibitors, pH and temperature.

A fermenter may hold several thousand litres of the growth medium. So, fermenters allow the production of materials in bulk quantities. Massive amounts of medicines, insulin, human growth hormone and other proteins are being produced in fermenters and this production proves much inexpensive.